TOC 14-00

PART I - BIDDING REQUIREMENTS, CONTRACT FORMS AND CONDITIONS OF THE CONTRACT

DIVISION 1 - GENERAL REQUIREMENTS

DIVISIONS 2 – SITE WORK

DIVISIONS 3 - CONCRETE

DIVISIONS 4 THRU 14 - (NOT USED)

DIVISION 15 - MECHANICAL

DIVISION 16 - ELECTRICAL

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BIDDING SCHEDULE NOTES

1. All quantities shown on the BIDDING SCHEDULE are estimated quantities except when the unit is shown as lump sum ":LS"

2. When bids are solicited on an unit price basis, bidders shall insert in the spaces provided therefor in the SCHEDULE both the "unit price" and the "estimated amount" resulting from applying the said unit price to the estimated quantity shown. In event the bidder quotes only a total price ("estimated amount") in its bid and fails to quote the unit price, the Government will determine such unit price by dividing the total price quoted by the quantity of the item set out in the SCHEDULE. The bidder agrees that the unit price so determined shall be used for the purpose of bid evaluation, award and all payments to the contractor including final payment.

3. All extensions of the unit prices shown will be subject to verification by the Government. In case of variation between the unit price and the extension, the unit price will be considered to be the bid and the extension will be corrected accordingly.

4. If a modification to a bid based on unit prices is submitted, which provides for a lump sum adjustment to the total estimated cost, the application of the lump sum adjustment to each unit price in the bid schedule must be stated. If it is not stated, the bidder agrees that the lump sum adjustment shall be applied on a pro rate basis to every unit price in the schedule.

5. Bidders are required to bid on all items listed on the bidding Schedule in addition to inserting a total quoted bid in the appropriate space provided. Failure to do so will be considered good cause to disqualify the bid.

6. Bidders are encouraged to pay particular attention to the requirements on lab "validation" in Section 01440 of the contract specifications.

7. TEMPORARY PROJECT SAFETY FENCING. Bidders are advised that Paragraph 04. A. 04 of Safety and Health Requirements Manual EM 385-1-1 dated September 3, 1996, requires temporary project safety fencing on projects located in areas actively utilized by the general public. The requirements for temporary project safety fencing on this project are specified in SECTION 01500 entitled TEMPORARY CONSTRUCTION FACILITIES.

NOTICES

1. SOLICITATION DEFINITIONS ARE PRESCRIBED IN FAR 52.214.1.

2. BIDDERS MUST PROVIDE FULL, ACCURATE, AND COMPLETE INFORMATION AS REQURED BY THIS SOLICITATION AND ITS ATTACHMENTS. THE PENALTY FOR MAKING FALSE STATEMENTS IN BIDS IS PRESCRIBED IN 18 USC 1001. (FAR 52.214-4)

ABBREVIATIONS

LS	Lump Sum
EA	Each
LF	Linear Feet

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SECTION 00010 Solicitation Contract Form

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001	Mobilization & Demobilization	1.00	Lump Sum	_____	_____
0002	Establishment of Turf	1.00	Lump Sum	_____	_____
0003	Clearing, Grubbing, & Stripping	1.00	Lump Sum	_____	_____
	Roads and Parking				
0004	Earthwork	1.00	Lump Sum	_____	_____
0005	Pavement	1.00	Lump Sum	_____	_____
	Site Utilities				
0006	Electrical Work	1.00	Lump Sum	_____	_____
0007	Water Line 1 1/1 inch	3,592.00	Linear Foot	_____	_____
0008	Water Line 2 inch	885.00	Linear Foot	_____	_____
0009	Water Line 3 inch	980.00	Linear Foot	_____	_____
0010	Lift Station, Area 4	1.00	Lump Sum	_____	_____
0011	Lift Station, Area 3	1.00	Lump Sum	_____	_____

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0012	3 Inch Pressure Sewer	2,720.00	Linear Foot	_____	_____
0013	8 Inch Gravity Sewer	3,813.00	Linear Foot	_____	_____
0014	4 Inch Sewer Serviceline	100.00	Linear Foot	_____	_____
0015	Manholes	14.00	Each	_____	_____
0016	Remove & Replace Manholes	3.00	Each	_____	_____
0017	Manhole Demolition	6.00	Each	_____	_____
0018	Air Release Valve	1.00	Lump Sum	_____	_____

TOTAL ALL BID ITEMS $_____

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SECTION 00800 - SPECIAL CLAUSES

1. NOT USED.

2. PAY REQUESTS. Pay requests authorized in the Contract Clause entitled "Payments Under Fixed-Price Construction Contracts", will be paid pursuant to the clause entitled "Prompt Payment for Construction Contracts". Pay requests shall be submitted on ENG Form 93 and 93a, "Payment Estimate-Contract Performance" and "Continuation", respectively. All information and substantiation required by the identified contract clauses shall be submitted with the ENG Form 93, and the required certification shall be included on the last page of the ENG Form 93a, signed by an authorized official of the Contractor and dated when signed. The designated billing office is the Office of the Area Engineer.

3. PHYSICAL DATA (APR 1984). FAR 52.236-4. Data and information furnished or referred to below is furnished for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

a. Physical Conditions. The indications of physical conditions on the drawings and in the specifications are the result of site investigations. The Government has acquired permits pertaining specifically to this contract. After award a copy of each permit will be provided to the Contractor. A listing of permits acquired by the Government is as follows:

(1) National Pollution Discharge Elimination System (NPDES)

(2) Section 404 of the Clean Water Act (404 Permit)

(3) Section 401 Water Quality Certification (401 Permit)

(4) Construction & Operations Permit from
Illinois Environmental Protection Agency (IEPA)

b. Weather Conditions. Information with respect to temperatures and precipitation may be obtained from the National Weather Service.

c. Transportation Facilities. Railroads and highways serve the general area of the work.

4. WORK AREAS. In accordance with the Contract Clause entitled, "Operations and Storage Areas", and subject to the approval of the Contracting Officer and the restrictions imposed by SECTION 01130 - ENVIRONMENTAL PROTECTION, of the Technical Provisions, the Contractor will be allowed use of Government-controlled land within the construction limits shown on the drawings or as specified herein. Any additional land, including ingress and egress, required by the Contractor, shall be obtained by the Contractor at its own expense.

5. PUBLIC UTILITIES AND PRIVATE IMPROVEMENTS.

a. Unless otherwise specified, shown on the drawings, or stated in writing by the Contracting Officer, the Contractor shall not move or disturb any public utilities or private improvements. Such removals, alterations, and/or relocations, where necessary, will be made by others. The locations shown on the drawings for underground utilities are approximate only. The exact locations of such utilities shall be determined by the Contractor in the field prior to commencing construction operations in their vicinity.

b. The attention of the Contractor is directed to the possibility that public utilities or private improvements may be encountered within the construction limits, some of which may be buried, and the existence of which is presently not known. Should any such utilities or improvements be encountered, the Contractor shall immediately notify the Contracting Officer so that a determination may be made as to whether they shall be removed, relocated, or altered. After such determination is made, the Contractor shall, if so directed by the Contracting Officer, remove, relocate, or alter them as required and an equitable adjustment will be made. In the event the Contracting Officer arranges for such removals, alterations, or relocations to be performed by others, the Contractor shall cooperate with such others during the latters' removal, alteration, or relocation operations.

6. DAMAGE TO WORK. The responsibility for damage to any part of the permanent work shall be as set forth in the Contract Clause entitled "Permits and Responsibilities." However, if in the judgment of the Contracting Officer any part of the permanent work performed by the Contractor is damaged by flood or earthquake, which damage is not due to the failure of the Contractor to take reasonable precautions or to exercise sound engineering and construction practices in the conduct of the work, the Contractor shall make the repairs as ordered by the Contracting Officer and full compensation for such repairs will be made at the applicable contract unit or lump sum prices as fixed and established in the contract. If in the opinion of the Contracting Officer there are no contract unit or lump sum prices applicable to any part of such work, an equitable adjustment pursuant to the Contract Clause entitled, "Changes," of the contract will be made as full compensation for the repairs of that part of the permanent work for which there are no applicable contract unit or lump sum prices. Except as herein provided, damage to all work (including temporary construction), utilities, materials, equipment, and plant shall be repaired to the satisfaction of the Contracting Officer at the Contractor's expense, regardless of the cause of such damage.

7. LAYOUT OF WORK.

a. The Government will establish the following base lines and bench mark at the site of the work:

(1) One benchmark (vertical control) at each area.

(2) Two horizontal control points (with coordinate values). at each area.

b. From the base lines and bench marks established by the Government, the Contractor shall complete the layout of the work and shall be responsible for all measurements that may be required for the execution of the work to the location and limit marks prescribed in the specifications or on the contract drawings, subject to such modifications as the Contracting Officer may require to meet changed conditions or as a result of necessary modifications to the contract work.

c. The Contractor shall furnish at its own expense such stakes, templates, platforms, equipment, tools and material, and all labor as may be required in laying out any part of the work from the base lines and bench marks established by the Government. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other marks established by the Contracting Officer until authorized to remove them, and if such marks are destroyed by the Contractor or through its negligence prior to their authorized removal, they may be replaced by and at the discretion of, the Contracting Officer, and the expense of replacement will be deducted from any amounts due or to become due the Contractor. The Contracting Officer may require that work be suspended at any time when location and limit marks established by the Contractor are not reasonably adequate to permit checking of the work.

8. NOT USED.

9. PARTIAL PAYMENT. At the discretion of the Contracting Officer, partial payment will be made for equipment delivered and stored on site or off site providing such storage is in accordance with the provisions of these specifications and the Contractor furnishes satisfactory evidence that title to such equipment has been acquired and that it will be utilized on the work covered by these specifications. Partial payment is defined as the invoice amount plus shipping costs. If the equipment is stored off site, the Government shall have the right to inspect the equipment.

10. CERTIFICATES OF COMPLIANCE. Any certificates required for demonstrating proof of compliance of materials with specification requirements shall be executed in 3 copies. Each certificate shall include the signature and title of an official authorized to certify in behalf of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from responsibility for furnishing satisfactory material if, after tests are performed on selected samples, the material is found not to meet the specific requirements.

11. PURCHASE ORDERS. Two copies of all purchase orders for other than stock materials showing the firm names and addresses and list of material shall be furnished to the Contracting Officer or an authorized representative as soon as issued.

12. SAFETY AND HEALTH REQUIREMENTS MANUAL EM 385-1-1. The Safety and Health Requirements Manual EM 385-1-1 forms a part of these specifications. EM 385-1-1 and its changes are available at http://www.hq.usace.army.mil (at the HQ homepage, select Safety and Occupational Health). The Contractor shall be responsible for complying with the current edition and all changes posted on the web as of the effective date of this solicitation. EM 385-1-1 is provided on the CD-ROM and the St. Louis District web site for each solicitation, however the Contractor shall be responsible for obtaining any changes to the manual which are available on the above web site.

13. ACCIDENT INVESTIGATIONS AND REPORTING. Refer to EM 385-1-1, Paragraph 01.D. Accidents shall be investigated and reports completed by the immediate supervisor of the employee(s) involved and reported to the Contracting Officer or an authorized representative within one working day after the accident occurs. The accident Investigation report shall be made on ENG Form 3394.

14. ACCIDENT PREVENTION PROGRAM. Refer to Contract Clause FAR 52.236-13 entitled, "Accident Prevention". Within 15 days after receipt of Notice of Award of the contract, and at least 7 days prior to the prework conference, the original and one copy of the Accident Prevention Program shall be submitted to the Contracting Officer for review. The program shall be prepared in the following format:

a. An executed MVS Form 385-33, Administrative Plan.

b. An executed MVS Form 385-359-R, Hazard Analysis.

c. A copy of company policy statement of accident prevention and any other guidance statements normally provided new employees. Each company employee shall be required to sign the company policy statement of accident prevention to verify that all employees have been informed of the safety program, and such signed statements shall be maintained at the project site.

The Contractor shall not commence physical work at the site until the program has been reviewed and found acceptable by the Contracting Officer, or an authorized representative. At the Contracting Officer's discretion, the Contractor may submit its Activity Hazard Analysis only for the first phase of construction provided that it is accompanied by an outline of the remaining phases of construction. All remaining phases shall be submitted and accepted prior to the beginning of work in each phase. Also refer to Section 1 of EM 385-1-1.

15. DAILY INSPECTIONS. The Contractor shall perform daily safety inspections and record them on the forms approved by the Contracting Officer. Reports of daily inspections shall be maintained at the job site. The reports shall be records of the daily inspections and resulting actions. Each report shall include, as a minimum, the following:

a. Phase(s) of construction underway during the inspection.

b. Locations of areas inspections were made.

c. Results of inspection, including nature of deficiencies observed and corrective actions taken, or to be taken, date, and signature of the person responsible for its contents.

16. ENVIRONMENTAL LITIGATION.

(a) If the performance of all or any part of the work is ordered by a court of competent jurisdiction to be suspended, delayed, or interrupted as a result of environmental litigation, as defined below, the Contracting Officer, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor or a Subcontractor at any tier not required by the terms of this contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a Subcontractor at any tier other than as required by the terms of this contract, such suspension, delay, or interruption shall be considered as if ordered by the Contracting Officer in the administration of this contract under the terms of the Contract Clause entitled "Suspension of Work".

(b) The term "environmental litigation", as used herein, means a lawsuit alleging that the work will have an adverse effect on the environment or that the Government has not duly considered, either substantively or procedurally, the effect of the work on the environment.

17. TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER.

a. This provision specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the Contract Clause entitled, "Default (Fixed-Price Construction)". In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

b. The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
(12)	(11)	(8)	(7)	(7)	(5)	(6)	(6)	(5)	(6)	(7)	(10)

c. Upon acknowledgement of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor shall record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph b, above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the Contract Clause entitled "Default (Fixed Price Construction)".

18. SUBCONTRACTS. In accordance with the Contract Clause entitled "Subcontracts", the Contractor shall, within seven days after the award of any subcontract by the Contractor or a Subcontractor, deliver to the Contracting Officer two copies of a completed Standard Form 1413. Both copies must contain the original signatures of both parties.

19. REQUIRED INSURANCE.

a. As required by the Contract Clause entitled "Insurance-Work on a Government Installation", the Contractor shall within 15 days after receipt of Notice of Award and prior to the commencement of work, furnish to the Contracting Officer, a written statement as evidence of the following minimum insurance:

(1) Workmen's Compensation. Amounts required by applicable jurisdictional statutes.

(2) Employer's Liability Insurance. $100,000

(3) Comprehensive General Liability Insurance.

Bodily Injury - $500,000 per occurrence

(4) Comprehensive Automobile Insurance.

Bodily Injury - $200,000 each person
$500,000 each accident
Property Damage - $ 20,000 each accident

b. Statements of insurance should be submitted to the following address:

Department of the Army
St. Louis District, Corps of Engineers
Central Area Office; CEMVS-CO-CA
301 Riverlands Way
West Alton, Missouri 63386

20. PROTECTION OF MATERIAL AND WORK. The Contractor shall at all times protect and preserve all materials, supplies, and equipment of every description (including property which may be Government-furnished or owned) and all work performed. All reasonable requests of the Contracting Officer to enclose or specially protect such property shall be complied with. If, as determined by the Contracting Officer, material, equipment, supplies, and work performed are not adequately protected by the Contractor, such property may be protected by the Government and the cost thereof may be charged to the Contractor or deducted from any payments due to the Contractor.

21. CONTAMINATION OF WATER. In addition to the requirements set forth in 01130-3.3, Protection of Water Resources, the Contractor shall take positive protective measures to prevent spillage of potential pollutant materials such as fuel, emulsion materials, chemicals etc., from storage containers or equipment, into lakes or tributary waters. Such positive protective measures may include, but not limited to, the following:

(1) A berm enclosure of sufficient capacity to contain such materials.

(2) Security measures to prevent acts of vandalism which could result in spillage of such materials (fences, guards, etc.).

(3) Storage of such materials in an area where the terrain would preclude leakage into lake or tributary waters.

(4) Utilization of secure Government storage areas if the Contracting Officer indicates such space is available. No storage past immediate needs (2 days) without the consent of the Contracting Officer.

The Contractor shall submit its proposals for implementing the above provisions in accordance with 01130-1.5, Environmental Protection Plan.

22. COMMERCIAL WARRANTY. The Contractor agrees that the standard commercial equipment furnished under this contract shall be covered by the most favorable commercial warranties the manufacturer gives to any customer for such equipment, and that the rights and remedies provided herein are in addition to and do not limit any rights afforded to the Government by any other clause of this contract. The Contractor shall furnish two copies of the warranties to the Contracting Officer.

23. ORDER AND COORDINATION OF WORK. The Contractor may start and complete the work in such order and sequence as desired subject to compliance with the following paragraphs:

a. Construction Schedule. Prior to commencing work, the Contractor shall submit to the Contracting Officer for approval, a proposed construction schedule for accomplishing the work as specified in SECTION 01310. The Contracting Officer reserves the right to restrict construction activity at certain times in order to minimize disruption to Lake Activities. The following restrictions shall apply and should be reflected in the Contractor's proposed schedule:

(1) Recreation Area Traffic – Traffic along the existing Bo Wood main road shall be maintained at all times.

b. Access To The Work Site. Prior to commencing work or hauling any materials to the work site using existing local, County or State roads, the Contractor shall submit a Plan to the Contracting Officer for approval. This plan shall indicate the roads the Contractor proposes to use to get the various materials from their place of origin to the work site. The plan shall indicate the type of haul units the Contractor proposes to use to transport the material along with each units maximum wheel and axle loads. Prior to submitting the Plan to the Contracting Officer, the Contractor shall have the plan approved by the governing body having jurisdiction over each road the Contractor proposes to use. Below are listed several of the governing agencies having jurisdiction of the roads around the Lake Shelbyville area:

(1) City of Shelbyville (217) 774-5531

(2) Shelby County (217) 774-2721

(3) Shelby Township (217) 774-5087

(4) Okaw Township (217) 756-8280

(5) Moultrie County (217) 728-4142

(6) City of Sullivan (217) 728-7821
Toby Shafer

(7) Sullivan Township (217) 728-7001
Elmo Weaver

No construction traffic will be permitted on the Dam Road. The Contractor will be responsible for repairing any damage to the park roads caused as a result of construction traffic.

c. Haul Road Construction, Maintenance and Removal. The haul roads necessary for construction of the project shall be constructed of materials of the Contractor's choosing. Maintenance of the haul roads shall be the responsibility of the Contractor. The haul roads shall be kept well drained and shall not interfere with existing drainage patterns. Temporary culverts or drain tiles shall be installed by the Contractor as necessary. After completion of construction the Contractor shall remove the haul roads and restore the area to its condition prior to construction. Construction,

maintenance, removal of the haul roads, and restoration shall be considered incidental to the construction of the shoreline protection and no additional compensation shall be allowed.

d. Speed Limit. The Contractor will be required to strictly adhere to a 25-MPH speed limit, or lower speeds as posted, for all of trucks or other vehicles traversing the Corps of Engineer roads at Lake Shelbyville.

e. Load Restrictions; 1 FEB – 15 APR. During the period 1 February thru 15 April, all roads in the Lake Shelbyville area have load restrictions as follows: 4 net load tons on a two-axle truck, 7 net load tons on a tandem axle truck, 10 net load tons on a tridem axle truck, and 13 net load tons on a tractor-trailer unit. From 1 February thru 28 February, if the ground is frozen and with the approval of the Contracting Officer, the Contractor will not be restricted with the above load limits, but will be required to adhere to the load limits specified in paragraph f.

f. Load Restrictions; 16 APR – 31 JAN. During the period 16 April to 31 January all roads in the Lake Shelbyville area have load restrictions as follows: 7 net load tons on a two-axle truck, 12 net load tons on a tandem axle truck, 15 net load tons on a tridem axle truck, and 20 net load tons on a tractor-trailer unit.

g. Haul Permits. The Contractor shall acquire all necessary permits for hauling over area roads.

h. Archaeological Sites. All ground disturbing activities, including roads, staging areas or other temporary facilities, shall avoid potentially eligible archaeological site 11MT208 (temporary #12), located north of Existing Monument (located approximately 400 ft west of proposed Area 4 Access Road).

Some archaeological sites in the general project area have been determined to be unimportant (ineligible for the National Register). These will not require further archaeological work or work cessation if cultural material is encountered during construction (unless, in the opinion of the Contracting Officer in consultation with project archeologist something very unusual is encountered). Possible locations of unimportant archaeological sites in the construction area are: 1) Area 3, west side of campground loop – historic site 11MT205 (temporary #9); 2) Area 4, north side of campground loop – prehistoric site 11MT210 (temporary #15). The locations of the known archaeological site areas shall be verified with the Contracting Officer and Lake Shelbyville management prior to the commencement of work.

i. Contractor Staging and Storage Areas. The Contractor staging and storage areas shall be located within the Bo Woods Recreation Area. The Contractor shall coordinate the location of these areas with the Contracting Officer prior to bringing any material or equipment on site.

24. AS-BUILT DRAWINGS.

a. "As-Built" Contract Drawings. The Contractor shall maintain a

separate set of full-size contract drawings, marked up in red, to indicate as-built conditions. Each as-built contract drawing shall include the Contract Number (DACW43-XX-C-XXXX) associated with the contract. These drawings shall be maintained in a current condition at all times until completion of the work and shall be available for review by Government personnel at all times. All variations from the contract drawings, for whatever reason, including those occasioned by modifications, optional materials, and the required coordination between trades, shall be indicated. These variations shall be shown in the same general detail utilized in the contract drawings. Upon completion of the work, two (2) sets of the marked-up drawings shall be furnished to the Contracting Officer prior to acceptance of the work. The Government will withhold two percent of the total bid price of the items for which as-built contract drawings have not been submitted.

b. "As-Built" Shop Drawings. Upon completion of items of work, the Contractor shall revise the shop drawings to show "as-built" conditions. The notation "Revised to show 'as-built' conditions" shall be placed in red in the lower right corner of each drawing along with the initials of a responsible company representative. Each as-built shop drawing or catalog cut shall be identified by the Contract Number (DACW43-XX-C-XXXX) associated with the contract, and corresponding transmittal number from ENG Form 4025. "As-built" shop drawings of each Contractor-prepared construction drawing should be prepared as soon as possible after the construction detailed on a given drawing has been completed. After the "as-built" shop drawings have been prepared as described above and within 15 days after the contract completion date, the Contractor shall submit four (4) complete sets of as-built shop drawings, including catalog cuts, to the Contracting Officer. The Government will withhold two percent of the total bid price of the item for which as-built shop drawings have not been submitted.

25 THRU 34. NOT USED.

35. HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997). FAR 52.223-3

(a) "Hazardous material", as used in this clause, includes any material defined as hazardous under the latest version of 29 CFR 1910.1200(g) (including revisions adopted during the term of the contract).

(b) The offeror must list any hazardous material, as defined in paragraph (a) of this clause, to be delivered under this contract. The hazardous material shall be properly identified and include any applicable identification number, such as National Stock Number or Special Item Number This information shall also be included on the Material Safety Data Sheet submitted under this contract.

Material (If none, insert "None")	Identification No.
_____	_____
_____	_____

(c) This list must be updated during performance of the contract whenever the Contractor determines that any other material to be delivered under this contract is hazardous.

(d) The apparently successful offeror agrees to submit, for each item as required prior to award, a Material Safety Data Sheet, meeting the requirements of 29 CFR 1910.1200(g) for all hazardous material identified in paragraph (b) of this clause. Data shall be submitted in accordance with 29 CFR 1910.1200(g), whether or not the apparently successful offeror is the actual manufacturer of these items. Failure to submit the Material Safety Data Sheet prior to award may result in the apparently successful offeror being considered nonresponsive and ineligible for award.

(e) If, after award, there is a change in the composition of the item(s) or a revision to 29 CFR 1910.1200(g), which renders incomplete or inaccurate the data submitted under paragraph (d) of this clause, the Contractor shall promptly notify the Contracting Officer and resubmit the data.

(f) Neither the requirements of this clause nor any act or failure to act by the Government shall relieve the Contractor of any responsibility or liability for the safety of Government, Contractor, or subcontractor personnel or property.

(g) Nothing contained in this clause shall relieve the Contractor from complying with applicable Federal, State, and local laws, codes, ordinances and regulations (including the obtaining of licenses and permits) in connection with hazardous material.

(h) The Government's rights in data furnished under this contract with respect to hazardous material are as follows:

(1) To use, duplicate and disclose any data to which this clause is applicable. The purposes of this right are to--

(i) Apprise personnel of the hazards to which they may be exposed in using, handling, packaging, transporting, or disposing of hazardous materials;

(ii) Obtain medical treatment for those affected by the material; and

(iii) Have others use, duplicate, and disclose the data for the Government for these purposes.

(2) To use, duplicate, and disclose data furnished under this clause, in accordance with subparagraph (h)(l) of this clause, in precedence over any other clause of this contract providing for rights in data.

(3) The Government is not precluded from using similar or identical data acquired from other sources.

36. PARTNERING. In order to most effectively accomplish this contract, the Government is willing to form a cohesive partnership with the Contractor. This partnership would strive to draw on the strengths of each organization in an effort to achieve a quality project done right the first time, within budget, and on schedule. This partnership would be bilateral in make-up and partnership will be totally voluntary. Any cost associated with effectuating this partnership will be agreed to by all parties and will be shared equally with no change in contract price.

-END OF SECTION 00800-

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DIVISION 1 - GENERAL REQUIREMENTS

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SECTION 01025
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 MOBILIZATION AND DEMOBILIZATION. Mobilization and demobilization will not be measured for payment. Payment for costs associated with mobilization and demobilization will be made at the contract lump sum price for "Mobilization and Demobilization", as defined in SECTION 00700 Contract Clauses.

1.2 ELECTRICAL WORK. Payment for site electrical work as specified in SECTION 16400 – ELECTRICAL WORK AND EQUIPMENT will be made at the contract Site Utilities lump sum prices for "Electrical Work", which price and payment shall constitute full compensation for providing all plant, labor, material, and equipment and performing all operations necessary to complete the work as shown on the drawings and as specified.

1.3 SEWER. Payment for providing sewer facilities as specified in the applicable parts of SECTION 02540 – SANITARY SEWERS will be made at the contract Site Utilities lump sum price for "8 Inch Gravity Sewer" and "4 Inch Sewer Serviceline", which price and payment shall constitute full compensation for providing all plant, labor, material, and equipment and performing all operations necessary to complete the work as shown on the drawings and as specified.

1.4 ESTABLISHMENT OF TURF. Payment for establishment of turf will be made at the applicable contract lump sum prices for "Establishment of Turf", which prices and payments shall constitute full compensation for all costs associated with establishing turf, as specified in SECTION 02920 - ESTABLISHMENT OF TURF, and as shown on the drawings. Restoration of haul roads shall be considered incidental to the haul road work.

1.5 WATER LINE; 1½ INCH, 2 INCH, 3 INCH

1.5.1 Measurement. Water lines will be measured for payment by the linear foot of water line in place measured along the centerline of the pipe.

1.5.2 Payment. Payment for the water lines will be made at the applicable contract Site Utilities unit price per linear foot for “Water Line 1½ Inch”, “Water Line 2 Inch”, and “Water Line 3 Inch” which prices and payments shall constitute full compensation for furnishing and installing the water line including all accessories required as specified in SECTION 02510 – WATER SUPPLY LINES, and as shown on the drawings.

1.6 LIFT STATIONS. Payment for the lift stations will be made at the contract Site Utilities lump sum price for "Lift Station, Area 4" and “Lift Station, Area 3”, which price and payment shall constitute full compensation for all costs associated with providing the lift stations as specified in SECTION 02535 - LIFT STATION, and as shown on the drawings.

1.7 PRESSURE SEWERS

1.7.1 Measurement. Pressure sewer lines will be measured for payment by the linear foot of sewer line in place measured along the centerline of the pipe.

1.7.2 Payment. Payment for the pressure sewer lines will be made at the applicable Site Utilities contract unit price per linear foot for “3 Inch Pressure Sewer”, which prices and payments shall constitute full compensation for furnishing and installing the sewer line including all accessories required as specified in SECTION 02530 – PRESSURE SEWER LINES, and as shown on the drawings.

1.8 MANHOLES, REMOVE AND REPLACE MANHOLES. Payment for the manholes will be made at the applicable Site Utilities contract unit price per each for “Manholes” and "Remove and Replace Manholes". Prices and payments shall constitute full compensation for removal of existing manholes, and furnishing and installing new manholes, including all accessories required, as specified in SECTION 02540 - SANITARY SEWERS, and as shown on the drawings.

1.9 CLEARING, GRUBBING AND STRIPPING. Payment for all work covered by SECTION 02110 – CLEARING, GRUBBING AND STRIPPING, including the disposal of cleared materials, will be made at the applicable contract lump sum price for “Clearing, Grubbing and Stripping", which prices and payments shall constitute full compensation for all costs of furnishing all labor, equipment, tools, and incidentals necessary to complete the work, including removing and/or disposing of the cleared, grubbed and stripped materials.

1.10 EARTHWORK. Payment for earthwork covered by SECTION 02225 – EARTHWORK will be made at the applicable contract Roads And Parking lump sum price for “Earthwork", which prices and payments shall constitute full compensation for all costs of furnishing all labor, equipment, tools, and incidentals in connection with the fill placement associated with the construction of the camp access roads and parking lots.

1.11 PAVEMENT. Payment for pavement covered by SECTION 02500 – CAMP ACCESS ROADS AND PARKING LOTS will be made at the applicable contract Roads and Parking lump sum price for “Pavement". Prices and payments shall constitute full compensation for all costs of furnishing all labor, equipment, tools, and incidentals in connection with the geotextile specified in SECTION 02240 – GEOTEXTILE, CMP culvert work as specified in SECTION 02610 - CMP CULVERT WORK, and for preparing the foundation, furnishing, hauling, handling, placing and maintaining the bituminous material, aggregate base course and prime coat as specified in SECTION 02500 - CAMP ACCESS ROADS AND PARKING LOTS as shown on the drawings.

1.12 MANHOLE DEMOLITION. Payment to demolish manholes will be made at the applicable contract Site Utilities unit price per each for “Manhole Demolition”, which prices and payments shall constitute full compensation for demolishing the manholes, including all accessories required, as specified in SECTION 02071 - MANHOLE DEMOLITION, and as shown on the drawings.

1.13 AIR RELEASE VALVE. Payment for air release valve will be made at the applicable contract Site Utilities lump sum price for “Air Release Valve”, which price and payment shall constitute full compensation for all costs associated with the air release valve as specified in SECTION 15120 - VALVES AND GAGES, and as shown on the drawings.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

-END OF SECTION 01025-

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SUBMITTAL REGISTER
(ER 415-1-10)

CONTRACT NO.

SHORELINE EROSION PROTECTION, PHASE 2B-LAKE SHELBYVILLE

CONTRACTOR

SPECIFICATION SECTION

					TYPE OF SUBMITTAL										CLASSI-FICATION			CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		
ACTIVITY NO a.	TRANS-MITTAL NO. b.	ITEM NO c.	SPECIFICATION PARAGRAPH NUMBER d.	DESCRIPTION OF ITEM SUBMITTED e.	DATA f.	DRAWINGS g.	INSTRUCTIONS h.	SCHEDULES i.	STATEMENTS j.	REPORTS k.	CERTIFICATES l.	SAMPLES m.	RECORDS n.	O&M MANUALS o.	INFORMATION ONLY p.	GOVERNMENT APPROVED q.	REVIEWER r.	SUBMIT s.	APPROVAL NEEDED BY t.	MATERIAL NEEDED BY u.	CODE v.	DATE w.	SUBMIT TO GOVERN-MENT x.	CODE y.	DATE z.	REMARKS aa.
			02110-1.2.1	DISPOSAL MATERIAL CONVEYANCE							X				X											
			02110-1.2.2	CLEARING PLAN					X							X										
			02225-1.5.1	LABORATORY & FIELD TEST REPORTS						X						X										
			02240-1.4.1	GEOTEXTILE CERTIFICATE							X					X										
			02315-1.4.1	GRADATION					X						X											
			02315-1.4.2	COMPACTION						X						X										
			02500-1.4.1	BITUMINOUS CONCRETE & AGGREGATE							X				X											
			02500-1.4.2	HAUL ROAD PLAN					X							X										
			02500-1.4.2	JOB MIX DESIGN					X							X										
			02500-1.4.3	COMPACTION						X						X										
			02510-1.3.1	MATERIALS & EQUIPMENT	X											X										
			02510-1.3.2	PURGING & DISINFECTION REPORTS						X					X											
			02510-1.3.3	PVC PIPE							X				X											
			02530-1.4.1	MATERIALS & EQUIPMENT	X											X										

SUBMITTAL REGISTER
(ER 415-1-10)

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SHORELINE EROSION PROTECTION, PHASE 2B-LAKE SHELBYVILLE

CONTRACTOR

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			02535-1.3.1	MATERIALS & EQUIPMENT	X											X										
			02535-1.3.2	MATERIALS & EQUIPMENT		X										X										
			02540-1.3.1	MATERIALS & EQUIPMENT		X										X										
			02610-1.4.1	CORRUGATED STEEL PIPE CULVERTS							X				X											
			03300-1.5.1	AIR-ENTRAINING AGENT	X										X											
			03300-1.5.1	WATER REDUCING ADMIXTURE	X										X											
			03300-1.5.1	CURING MATERIALS	X										X											
			03300-1.5.1	REINFORCING STEEL (MILL CERTIFICATES)	X										X											
			03300-1.5.1	FORMING ACCESSORIES	X										X											
			03300-1.5.1	JOINT MATERIAL	X										X											
			03300-1.5.1	NON-SHRINK GROUT	X										X											
			03300-1.5.2	CONCRETE MIX PROPORTIONS					X							X										
			03300-1.5.3	CEMENTITIOUS & AGGREGATE MATERIALS							X					X										
			15120.1.5.1	MATERIALS AND EQUIPMENT	X											X										

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SECTION 02110
CLEARING, GRUBBING, AND STRIPPING

PART 1 GENERAL

1.1 SCOPE. The work covered by this section consists of furnishing all plant, labor, equipment, and materials, and performing all operations necessary for the clearing, grubbing and stripping of the areas specified herein or indicated on the drawings, and for the removal and disposal of all cleared, grubbed, and stripped materials. The camp access road areas have been cleared and grubbed of the heavy vegetation in a previous contract. These areas will need to be re-cleared of the vegetation that has grown back since the previous contract. Parking areas and utility lines still need to be cleared and grubbed.

1.2 SUBMITTALS. Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted to the Contracting Officer in accordance with SECTION 01300 - SUBMITTAL PROCEDURES.

1.2.1 Certificates. Disposal material conveyance; FIO. Submit written evidence that permission for disposal of material on the owner's private property has been obtained from the property owner. The written evidence shall consist of an authenticated copy of the conveyance under which the Contractor acquired the property rights and access thereto, prepared and executed in accordance with the laws of the State in which the material is to be disposed.

1.2.2. Statements. Clearing Plan; GA. Submit a clearing plan for the gravity sewer construction prior to any clearing.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 CLEARING.

3.1.1 General. Clearing, unless otherwise specified, shall consist of the complete removal above the ground surface of all trees, stumps, down timber, snags, and brush from within the areas including the complete cleanup of the area by the removal and disposal of all debris resulting from clearing operations, to the extent hereinafter specified. Trees designated to be left standing are shown on the drawings.

3.1.2 Merchantable Timber. Merchantable timber, chipped material and other cleared material may be disposed of at the Contractor's option, as long as such merchantable timber and other cleared material are removed from the

area and are satisfactorily disposed of in accordance with the provisions of paragraph 02110-3.4.

3.1.3 Timber Clearing. Trees within the clearing area shall be felled in such a manner as to avoid damage to trees to be left standing and trees outside the clearing area, existing buildings, and facilities, and with due regard for the safety of employees and others.

3.1.4 Gravity Sewer Clearing. The Contractor shall submit for approval a clearing plan for the gravity sewers. A maximum of 20' each side of the sewer centerline is allowed.

3.2 GRUBBING.

3.2.1 General. Grubbing shall consist of the removal of all stumps. Roots and other projections larger than 1-1/2 inches in diameter shall be removed to a depth of 3 feet below the natural ground surface.

3.2.2 Areas to be Grubbed. Grubbing shall be performed within the limits of all areas designated for timber clearing, areas of excavation and areas to receive fill. All holes caused by grubbing operations, except areas of excavation, shall be backfilled with fill material, placed in 8-inch layers to an elevation of the adjacent ground surface, and each layer compacted to a density equivalent to that of the surrounding materials.

3.3 STRIPPING. Stripping shall consist of the removal of materials down to bare earth and without removing more earth than is necessary and no more than 6-inches.

3.4 DISPOSAL OF MATERIAL.

3.4.1 General. The cleared and grubbed materials shall be completely removed by transporting from the site as specified in 02110-3.4.2, or disposed of by burning in accordance with 02110-3.4.3, or chipping in accordance with 02110-3.4.4, unless otherwise approved by the Contracting Officer.

3.4.2 Removal from Site of Work. The Contractor shall remove from the site of the work, all cleared and grubbed material not disposed by burning. The debris shall be hauled to the nearest state approved landfill or disposal site. Such disposal shall comply with all applicable Federal, State, and local laws. The Contractor may at its option, either retain for its own use or dispose of by sale or otherwise, any such materials of value. The Government will not be responsible for the protection and safekeeping of any materials retained by the Contractor. Such materials shall be removed from the site of the work before the date of completion of the work. If material resulting from clearing operations is placed on private property, the Contractor shall obtain without cost to the Government, additional right-of-way for such purposes. Such material shall be so placed as not to interfere with roads, drainage or other improvements and in such a manner as to eliminate the possibility of its entering into channels, ditches, or streams. If the Contractor obtains temporary rights, then the period of time shall coincide with Section 00700 - Contract Clause 52.211-10 - Commencement Prosecution and

Completion of Work.

3.4.3 Burning. The Contractor shall comply with all applicable State and local air pollution restrictions. Subject to such restrictions and obtaining any required permit from the Illinois Environmental Protection Agency or any other permit which may be required by said State or local authority, the Contractor may burn material within the contract area, and at any time within the contract period provided such burning does not cause the above standards to be exceeded or does not interfere with inhabitants of the area by drastic changes in their accustomed environment, such as addition to air pollution or danger of fire. Such burning will require the use of an "air curtain" type incinerator. However, the specific time, location, and manner of burning concerning air pollution, governing fire laws, and safety, shall be subject to the approval of the Contracting Officer. Burning operations shall not be conducted within 200 feet of any standing timber or other flammable growth. The Contractor shall be responsible for any damage to life and/or property resulting from fires that are started by its employees as a result of contract operations. The Contractor shall furnish, at the site of burning operations, adequate fire fighting equipment to properly equip personnel for fighting fires. Fires shall be guarded at all times and shall be under constant attendance, day and night until they have burned out or have been extinguished. All burning shall be so thorough that the materials will be reduced to ashes. After burning operations are complete, the Contractor shall restore the area to existing conditions prior to burning, and in a manner satisfactory to the Contracting Officer.

3.4.4 Chipping. All cut timber, down timber, dead timber, branches, and brush may be chipped. The chips may be either sold off site or spread over the work site areas as a dust preventive measure. However, disposal by spreading shall be acceptable only in areas where the wood chips cannot be washed either into ditches or streams or off the right-of-way by rainfall runoff.

3.5 REMOVAL OF DEBRIS. The Contractor shall remove from within the clearing limits all debris consisting of, but not be limited to, glass, plastic, wood, cloth, paper, concrete rubble, metal, brick, rubber, etc., and dispose of in accordance with 02110-3.4.2.

3.6 STRIPPED MATERIAL. All material resulting from the stripping operations shall be spread smoothly in adjacent areas to the construction.

-END OF SECTION 02110-

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SECTION 02315
EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITES

PART 1 - GENERAL

1.1 SCOPE. The work covered by this section includes furnishing all labor, equipment, and materials and performing all operations necessary for excavating, trenching, and backfilling for utilities as indicated on the drawings and as specified herein.

1.2 REFERENCES. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

1.2.1 American Society for Testing and Materials (ASTM).

ASTM D 698-91	Laboratory Compaction Characteristics of Soil Using Standard Effort
ASTM D 1556-90	Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557-91	Laboratory Compaction Characteristics of Soil Using Modified Effort
ASTM D 2216-92	Laboratory Determination of Water (Moisture) Content of Soil and Rock
ASTM D 2487-93	Classification of Soils for Engineering Purposes

1.2.2 Illinois Standard Specifications. The CA-6 material shall conform to the provisions of the hereinafter cited sections and, as specified articles of the Illinois Department of Transportation (IDOT), "Standard Specifications for Road and Bridge Construction" adopted January 1, 1997 except as noted herein. The term "Engineer" as used therein shall be interpreted to mean "Contracting Officer."

1.3 DEFINITIONS.

1.3.1 Degree of Compaction. Degree of compaction required for cohesive materials is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 698 and D1557 abbreviated hereinafter as percent laboratory maximum density.

1.4 SUBMITTALS. Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted to the Contracting Officer in accordance with SECTION 01300 - SUBMITTAL PROCEDURES.

1.4.1 Statements. Gradation; FIO. Submit statement certifying that the CA-6 material and the cohesionless material, conforms to the specified requirements.

1.4.2 Reports. Compaction; GA. Submit the results of all degree of compaction testing for each material type prior to fill placement.

1.5 QUALITY CONTROL. The contractor shall establish and maintain quality control for all operations to assure compliance with contract requirements and maintain records of its quality control for all construction operations, including but not limited to the following:

a. Trenching of utilities.
b. Backfilling and compacting of all excavated areas.
c. Gradation of the CA-6 and cohesionless material.
d. Inplace density results.

PART 2 - PRODUCTS

2.1 MATERIALS.

2.1.1 Cohesionless Materials. Cohesionless materials shall consist of any material classified by ASTM D 2487 as SP or SW with 100 percent passing the 1/2-inch size screen, or materials specified in paragraphs 2.1.4 and 2.1.5.

2.1.2 Unsuitable Materials. Foundation materials consisting of soft, wet, or organic material, debris, rubble, or any material over 3 inches in size in its maximum dimension shall be considered as unsuitable materials. In no case shall frozen materials be placed.

2.1.3 Cohesive Materials. Cohesive materials shall include materials classified by ASTM D 2487 as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic.

2.1.4 Granular Backfill Material. Granular backfill shall consist of CA-6 material conforming to IDOT Specification Section 1004, COARSE AGGREGATE.

2.1.5 Plastic Marking Tape. Plastic marking tape shall be acid and alkali-resistant polyethylene film, 6 inches wide with minimum thickness of 0.004 inch. Tape shall have a minimum strength of 1750 psi lengthwise and 1500 psi crosswise. The tape shall be manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to 3 feet deep. The tape shall be of a type specifically manufactured for marking and locating underground utilities. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. Tape color shall be as specified below and shall bear a continuous printed inscription describing the specific utility.

Tape Color	Item
Red:	Electric
Yellow:	Gas, Oil, Dangerous Materials
Orange:	Telephone, Television, Police, and Fire Communications
Blue:	Water Systems
Green:	Sewer Systems

PART 3 - EXECUTION

3.1 EXCAVATION. Excavation shall be performed to the lines and grades indicated, or if not indicated, to the lines and grades necessary for placement of utility lines. During excavation, material suitable for backfilling shall be stockpiled in an orderly manner at a distance from the banks of the trench equal to half the depth of the excavation, but in no instance closer than allowed by Section 25 of the Safety and Health Requirements Manual EM 385-1-1, dated September 3, 1996. Height of the stockpiled material shall be maximum 8 feet. Grading shall be done as may be necessary to prevent surface water from flowing into the excavation, and any water accumulating therein shall be removed to maintain the stability of the bottom and sides of the excavation. Unauthorized over excavation shall be backfilled, with CA-6 material, in accordance with paragraph 3.2. BACKFILLING AND COMPACTION, at no additional cost to the Government. Stockpiles shall be kept in a neat and well drained condition, giving due consideration to drainage at all times. Stockpiles of suitable materials shall be protected from contamination, which may destroy the quality and fitness of the stockpiled material. If the Contractor fails to protect the stockpiles, and any material becomes unsuitable, such material shall be removed and replaced with suitable material from approved sources at no additional cost to the Government.

3.1.1 Trench Excavation. The trench shall be excavated to the lines and limits as shown on the drawings. Trench walls below the top of the pipe shall be sloped, or made vertical, and of such width as recommended in the manufacturer's installation manual. Where no manufacturer's installation manual is available, trench walls shall be made vertical. Trench walls more than four feet high shall be shored with a trench box, cut back to a stable slope, or provided with equivalent means of protection for employees who may be exposed to moving ground or cave in. Vertical trench walls more than four feet high shall be shored with a trench box. Trench walls which are cut back shall be excavated to at least the angle of repose of the soil. Special attention shall be given to slopes that may be adversely affected by weather or moisture content. The trench excavation of the gravity sewer line shall be shored with a trench box.

3.1.1.1 Bottom Preparation. The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Bell holes shall be excavated to the necessary size at each joint or coupling to eliminate point bearing. Stones of 3 inches or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, shall be removed to avoid point bearing.

3.1.1.2 Control of Water. While sewers and appurtenances are under construction, the Contractor shall keep all excavations free of water at its own expense. The Contractor shall provide all dams, flumes, channels, sumps, or other works necessary to keep the excavation entirely clear of water and shall provide and operate pumps or other suitable equipment of adequate capacity for dewatering the excavations. The Contractor shall avoid producing mud in the trench or channel bottom by construction operations. Soil which becomes soft as a result of improper drainage shall be removed and replaced with crushed stone base material at the Contractor's own expense to maintain a

firm dry excavation bottom and base. Pipe bedding, laying, jointing, and the placing of concrete or masonry shall be accomplished in a water-free trench or excavation, which shall be kept clear of water until pipe joints, concrete and masonry have set and are resistant to water damage. The water shall be disposed of in a manner approved by the Contracting Officer.

3.1.1.3 Removal of Unsuitable Material. Where unsuitable material is encountered in the bottom of the trench, such material shall be removed to the depth directed and replaced to the proper grade with CA-6 material as provided in paragraph 3.2 BACKFILLING AND COMPACTION.

3.2 BACKFILLING AND COMPACTION. Unless otherwise indicated, backfill shall be placed in layers not exceeding 6 inches loose thickness for compaction by hand operated machine compactors, and 8 inches loose thickness for other than hand operated machines.

3.2.1 Utility Trench Backfill. Trenches shall be backfilled to the grade shown, or if not shown, to match the existing adjacent grades.

3.2.1.1 Replacement of Unsuitable Material. Unsuitable material removed from the bottom of the trench or excavation shall be replaced with CA-6 material placed in layers not exceeding 6 inches loose thickness. The backfill material shall be compacted to 95% of the maximum dry density. The Contractor Quality Control shall perform a minimum of one in place density in accordance with ASTM D 1556 on the CA 6 granular backfill material per each area of replacement.

3.2.1.2 Bedding and Backfill. Utility lines installed in trench shall be bedded and backfilled with SP or SW cohesionless material as specified in paragraph 2.1 MATERIALS. The utility trench shall be backfilled to at least the lower half of the pipe prior to performing the required pressure tests. The joints and couplings shall be left uncovered during the pressure test. The backfill shall be placed 6 inches above and 4 inches below the utility lines as shown on the drawings and shall be compacted with approved tampers. The backfill shall be brought up evenly on both sides of the utility lines for the full length and compacted with a vibratory compactor having an operating weight of at least 240 pounds with a centrifugal force of 5200 pounds. A minimum of 6 passes shall be performed. Care shall be taken to ensure thorough compaction of the fill under the haunches of the pipe.

3.2.1.3 Final Backfill.

3.2.1.3.1 Water and Electrical Utility Trenches. The Contractor shall use the cohesive material from the excavation to backfill and compact the remaining portion of the water and electrical utility trenches. A minimum of 6 complete passes per layer shall be performed with a power tamping rammers. The power tamping rammers shall have a minimum impact force of 2,500 pounds per blow. The tamping (shoe) surface area shall be between 140 and 160 square inches. The Contractor may use other compaction equipment as approved by the Contracting Officer. Backfill for water and electrical utility trenches within 10 feet of any existing or proposed roads or buildings shall be placed in layers not exceeding 6 inches loose thickness and 9 inches loose thickness for all areas outside the 10 feet. The Contractor Quality Control shall obtain a minimum of two samples from the excavated material to determine the optimum

water content per ASTM D 698. The Contractor Quality Control shall perform a minimum of one in place water content per 200 feet of trench. The in place moisture content of the material being compacted shall be within 0 to +4% of the optimum water content.

3.2.1.3.2 Sewer Utility Trenches. The Contractor shall use the cohesive material from the excavation to backfill and compact the remaining portion of the sewer utility trench. A minimum of 6 complete passes per layer shall be performed with a power tamping rammers. The power tamping rammers shall have a minimum impact force of 2,500 pounds per blow. The tamping (shoe) surface area shall be between 140 and 160 square inches. The Contractor may use other compaction equipment as approved by the Contracting Officer. Backfill for the sewer utility trench within 100 feet of any existing or proposed roads or buildings shall be placed in layers not exceeding 9 inches loose thickness and 12 inches loose thickness for all areas outside the 100 feet. The Contractor Quality Control shall obtain a minimum of two samples from the excavated material to determine the optimum water content per ASTM D 698. The Contractor Quality Control shall perform a minimum of one in place water content per 200 feet of trench. The in place moisture content of the material being compacted shall be within 0 to +4% of the optimum water content.

-- END OF SECTION 02315 --

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SECTION 02500
CAMP ACCESS ROADS AND PARKING LOTS

PART 1 - GENERAL

1.1 SCOPE. The work covered by this section consists of furnishing all plant, labor, equipment and materials, and performing all operations in connection with the construction of the parking lots and camp access roads in the Bo Wood Recreational Area.

1.2 QUALITY CONTROL.

1.2.1 General. The Contractor shall establish and maintain quality control for all operations to assure compliance with contract requirements and maintain records of quality control for all construction operations, including but not limited to the following:

(1) Foundation preparation.

(2) Inspection at the worksite to ensure use of specified materials.

(3) Geotextile placement.

(4) Crushed aggregate base course: material gradation, stone quality, placement and compaction.

(5) Prime coat: material quality and application.

(6) Bituminous concrete: mix, temperature, placing, density, lines and grade. At the beginning of production the Contractor shall run an extraction test in conformance with ASTM D 2172 and sieve test in conformance with ASTM C 136 on each of the asphaltic concrete mixtures being used. The Contracting Officer will require additional extraction and sieve tests, at the Contractor’s expense if the material appears unacceptable.

1.2.2 Reporting. A copy of these records and tests, as well as the records of corrective action taken, shall be furnished to the Government daily.

1.2.3 Testing by the Government. During the life of this contract, quality assurance test will be performed by the Government to check the work performed by the Contractor for compliance with the specifications. The performance of such tests may cause the Contractor to be temporarily delayed in the prosecution of its work while tests are in progress. Such delays shall not be the basis for additional compensation and time.

1.3 APPLICABLE PUBLICATIONS. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

1.3.1 American Society for Testing and Materials (ASTM).

C 136-96a	Sieve Analysis of Fine and Coarse Aggregates
D 698-91 (R 1998)	Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600kN-m/cu. m.))
D 2172-95	Quantitative Extraction of Bitumen from Bituminous Paving Mixtures

1.3.2 Illinois Department of Transportation (IDOT). The material for, and construction of the crushed aggregate base course, bituminous concrete pavements, and other appurtenances shall conform to the provisions of the hereinafter cited sections and, as specified articles of the IDOT, "Standard Specifications for Road and Bridge Construction", and "Standard Plans" adopted January 1, 1997 except as noted herein. The term "Engineer" as used therein shall be interpreted to mean "Contracting Officer."

1.4 SUBMITTALS. Government approval is required for submittals with a GA designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with SECTION 01300 SUBMITTAL PROCEDURES:

1.4.1 Certificates. Bituminous concrete and aggregate base material; FIO. Submit a certificate of inspection for each shipment of bituminous concrete used in the work, and for the aggregate base material indicating the material meets IDOT specifications.

1.4.2 Statements.

Haul Road Plan; GA. Submit a haul road plan prior to delivering any materials to the site.

Job Mix Design; GA. Submit a job mix design for each type of bituminous concrete a minimum of 30 days prior to placing bituminous concrete, prepared in accordance with IDOT Specification-Article 406.10.

1.4.3 Reports.

Compaction; GA. Submit the results of all degree of compaction testing for each material type.

PART 2 - PRODUCTS

2.1 BITUMINOUS CONCRETE PAVEMENT.

2.1.1 General. This work shall consist of the construction of a bituminous concrete binder course and a bituminous concrete surface course on a prepared base, constructed to the lines, grades, and thicknesses at the

locations indicated on the plans or as directed by the Contracting Officer. Bituminous concrete pavements shall meet the requirements of IDOT Specification Section 406, BITUMINOUS CONCRETE BINDER AND SURFACE COURSE CLASS 1, except as noted herein.

2.1.2 Materials. Materials used in the production of the bituminous concrete binder and surface courses shall meet the applicable requirements of IDOT Specification Article 406.02, except that no Reclaimed Asphalt Pavement (RAP) shall be allowed in the mix. Asphalt cement shall be AC-5 or AC-10.

2.1.3 Equipment and Construction. Equipment used in the production and placement of the bituminous concrete pavements shall meet the applicable requirements of IDOT Specification Article 406.03. Construction methods shall meet the applicable requirements of IDOT Specification Article 406.04.

2.1.4 Job Mix Design. Mix designs for the specific mixes called for on the plans shall be established by the Illinois Department of Transportation (IDOT) or by the Contractor at his/her option as specified in IDOT Specification Article 406.10. Mix designs provided by IDOT will be acceptable provided the same material sources are used for the materials included in the mix. In the event a job mix design is not available from IDOT the Contractor shall be responsible for the design of the bituminous mixes.

2.1.5 Mixture Criteria. Mixture criteria shall be in accordance with IDOT Specification Article 406.13. The bituminous concrete base course shall meet the requirements for a Class I, Type 1, B Mix. The bituminous concrete surface course shall meet the requirements for a Class I, Type 1, C Mix.

2.2 AGGREGATE BASE COURSE.

2.2.1 General. This work shall consist of the installation of an aggregate base course over a geotextile, to the lines, grades and thickness indicated on the plans. The geotextile shall be installed in accordance with paragraph 02500-3.6. The aggregate base course shall meet the applicable requirements of the IDOT specification SECTION 351, AGGREGATE BASE COURSE except as noted herein.

2.2.2 Materials. The material used in the construction of the aggregate base course shall consist of crushed stone meeting the requirements of the IDOT specification SECTION 1004, COARSE AGGREGATES, and further, meeting the gradation requirements for CA 6.

2.3 PRIME COAT. A bituminous prime coat material of MC-30 shall be applied to the prepared aggregate base course in accordance with IDOT Specification Article 406.07. The prime coat shall be applied at the rate of 0.30 gallons per square yard. The prime coat shall be allowed to cure until the penetration has been approved by the Contracting Officer, but at no time shall the curing period be less than 24 hours. The Contractor shall take special precautions to prevent overspray of the prime coat and shall cover or otherwise protect concrete curbing to preclude getting prime coat material on them.

2.4 GEOTEXTILE. The Contractor shall install the geotextile as shown on the drawings.

PART 3 - EXECUTION

3.1 PREPARATION OF BITUMINOUS MIXTURES. Bituminous concrete base and surface course material shall be produced in accordance with IDOT Specification Article 406.12 by a plant certified by the IDOT for the production of hot mix asphalt products.

3.2 TRANSPORTATION. Transportation of bituminous concrete material to the job site shall be in accordance with IDOT Specification Article 406.14. Prior to transporting any material to the site, the haul road plan described in Special Clause paragraph 00800-29, shall have been approved.

3.3 PLACING, COMPACTION, AND JOINTS. Placing of bituminous concrete, compaction methods and requirements and joint construction shall be in accordance with IDOT Specification Articles 406.15 through 406.18.

3.4 SMOOTHNESS AND THICKNESS TESTING. After completion of the bituminous surface course the surface shall be tested for grade and smoothness. The surface course shall not vary by more than 1/2-inch from the plan grades. The surface course shall be tested for smoothness with a 16-foot straightedge provided by the Contractor. Pavement with surface variations exceeding 1/4-inch shall be removed and replaced by the Contractor. After the pavement has been tested for grade and smoothness and any corrections necessary have been made, the Contractor shall provide not less than 8 full depth cores of the completed bituminous pavement from the locations determined by the Contracting Officer. The cores shall be a minimum 4 inches in diameter and shall extend the full depth of the bituminous pavement. If the thickness of the combined bituminous concrete base and surface courses is deficient in excess of 1/4-inch as determined by the core measurements, the total area that is deficient in thickness shall be determined by additional cores. The area found deficient shall be removed and replaced to the proper thickness. Any pavement requiring removal and replacement in order to meet the job tolerances with respect to grade, smoothness or thickness shall be accomplished by the Contractor at no additional expense to the Government.

3.5 AGGREGATE BASE COURSE.

3.5.1 Construction Requirements. The base course shall be constructed in layers not exceeding 6 inches compacted, except that if test indicate that the required compaction is not being obtained, the lift thickness shall be reduced to facilitate compaction. The aggregate shall be placed so as to prevent segregation of the material. It shall be spread on the prepared subgrade and geotextile by tailgating from trucks to the desired lift thickness or placed with a spreader box or asphalt laydown machine. Dumping the material in piles and spreading with a blade or endloader will not be permitted. The aggregate base material shall be placed within 2 percent of the optimum moisture content and compacted to not less than 100 percent of the maximum dry density as determined by ASTM D 698.

3.5.2 Grade and Thickness Tolerances. After compaction the aggregate base course shall be tested for grade and smoothness. The finished surface of the aggregate base course shall not vary from plan grade by more the 1 inch. The finished surface shall be relatively smooth and free from ruts, bumps and depressions. After the aggregate base course has been brought to final grade it shall be tested for thickness. When the constructed thickness is less than 90 percent of the specified thickness shown on the plans, aggregate shall be added to obtain the required specified thickness.

3.6 INSTALLATION OF GEOTEXTILE. The geotextile shall be installed in accordance with SECTION 02240, Paragraph 3.1.

3.7 GENERAL. Areas outside the limits of the parking lot construction requiring grading or otherwise being disturbed shall be turfed in accordance with SECTION 02920 - ESTABLISHMENT OF TURF.

END OF SECTION 02500

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SECTION 02530
PRESSURE SEWER LINES

PART 1 - GENERAL

1.1 REFERENCES. The following publications of the issues listed below, but referred to thereafter by basic designation only form a part of this specification to the extent indicated by the reference thereto.

1.1.1 American Society for Testing and Material (ASTM).

A 53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

D 1784-92 Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds

D 2241-93 Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)

D 3034-93 Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

D 3139-89 Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals

F 477-93 Elastomeric Seals (Gaskets) for Joining Plastic Pipe

1.1.2 American Water Works Association (AWWA).

C 104-95 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water

C 110-93 Ductile-Iron and Gray-Iron Fittings, 3-in Through 48-in., (75 mm through 1200 mm) for Water and Other Liquids

C 111-95 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

C 150-91 Thickness Design of Ductile-Iron Pipe

C 151-91 Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids

C 200 Steel Water Pipe - 6 in. (150 mm) and Larger

1.2 GENERAL REQUIREMENTS. The pressure sewer piping shall be installed as specified herein and as shown on the contract drawings. The contract drawings indicate the general arrangement of the piping systems. If

any departures from the contract drawings are deemed necessary by the Contractor, details of such departures, including the reasons therefore, shall be submitted to the Contracting Officer in writing for approval, and written approval obtained, prior to implementation.

1.3 STANDARD PRODUCTS. Equipment and material shall be essentially standard products of the various manufacturers involved. Where two or more units or elements of the same type or class of equipment or material are required, these units or elements shall be products of a single manufacturer. All components which must be integrated such as the piping, valves, and fittings shall be submitted as one complete package to ensure compatibility.

1.4 SUBMITTALS. Government approval is required for submittals with a "GA" designation; submittals having and "FIO" designation are for information only. The following shall be submitted to the Contracting Officer in accordance with SECTION 01300 - SUBMITTAL PROCEDURES.

1.4.1 Data. Materials and Equipment; GA. Submit manufacturer's descriptive data for all materials and equipment specified herein.

PART 2 - PRODUCTS

2.1 PIPE.

2.1.1 Ductile Iron Pipe. Class 51, AWWA C 150 and C 151. Fittings shall conform to AWWA C 110. Cement mortar lining per AWWA C 104. The pipe shall be mechanical joint, push on, or flanged, depending on the type of service.

2.1.2 Polyvinyl Chloride (PVC) Pressure Sewer Pipe. PVC pressure sewer pipe shall be SDR-26, 160 psi, conforming to ASTM D2241 and furnished in minimum lengths of 20 feet. The PVC pipe shall be manufactured of materials conforming to ASTM D 1784, Type I, Grade 1254 B designated as PVC 1120.

2.1.3 Steel Casing Pipe. Casing Pipe shall be welded steel pipe, new material, conforming to **AWWA C 200** for water pipe, and steel conforming to **ASTM A 53**, Grade B, with a minimum yield strength of 35,000 psi. The wall thickness shall not be less than 0.1875 inches for 6 inch diameter and .203 inches for 12 inch diameter casing pipe.

2.2 RUBBER RINGS. Rubber Rings for bell-and-spigot as recommended by the manufacturer of the pipe. Gaskets and joints shall conform to the requirements of ASTM D 3139 and ASTM F 477.

2.3 THRUST BLOCKS. Plugs, caps, tees and bends deflecting 22-1/2 degrees or more, either vertically or horizontally, on pressure sewer and water lines shall be provided with thrust blocking. Thrust blocks shall be constructed of concrete as specified in SECTION 03300 and shall be as shown on the drawings.

2.4 Plastic Warning Tape. Plastic warning tape for the water line shall be as specified in Section 02315 - EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS. Excavation and backfilling of trenches shall conform to the applicable provisions of the referenced specifications and as stated herein. PVC pipe shall be protected during storage and installation from direct sunlight and excess heat.

3.2 PIPE INSTALLATION.

3.2.1 Cutting of Pipe. Cutting of pipe shall be performed in a neat and workmanlike manner without damage to the pipe. Unless otherwise recommended by the manufacturer or authorized by the Contracting Officer, cutting shall be accomplished with an approved type mechanical cutter. The pressure sewer shall be installed in one continuous length with no splices. Cutting will be permitted only when necessary to install fittings and valves.

3.2.2 Connection to Existing Structures. The Contractor shall connect the new 3-inch pressure sewer discharge lines to the existing manhole 1-3 as shown on the drawings. Care shall be taken to prevent damage to the existing structures. Interior grouting and patching shall be accomplished as soon as possible after the new pipe has been inserted into structure and has been adequately supported to prevent movement. Any damage to the structures shall be repaired by the Contractor at no additional expense to the Government.

3.2.3 Cross Connections and Interconnections. No piping shall be installed that will provide a cross connection or interconnection between a distribution supply for drinking or domestic purposes and a polluted supply such as a waste pipe.

3.2.4 Installation of PVC SDR 26 Pipe. Excavation and backfilling of trenches shall conform to the applicable provisions of SECTION 02315 - EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES. The pressure sewer lines shall be placed a minimum of 42 inches below the finished grade. Plastic PVC pipe shall be protected during storage and installation from direct sunlight and excess heat. Any deformed or defective pipe shall be replaced by the Contractor at no additional cost to the Government. All piping shall be assembled by a method approved by the Contracting Officer. Immediately after laying, plastic PVC pipe shall be covered leaving the joints exposed until after completion of the necessary tests.

3.2.4.1 Cutting of PVC Pipe. Cutting of PVC pipe shall be as specified in paragraph 3.2.1.

3.2.4.2 Jointing of PVC Pipe. Jointing PVC pipe shall be accomplished as specified by the manufacturer and/or as follows:

(1) Clean spigot ends, grooves, and gaskets of all dirt and foreign materials, paying particular attention to the gasket groove.

(2) Set the gasket in the groove making sure the gasket is not twisted or turned to prevent proper seating.

(3) Lubricate the plain end of the pipe and gasket with lubricant

as recommended by the manufacturer of the pipe.

(4) Push the plain end into the bell or coupling so that the mark on the plain end is in line with the end of the bell or coupling.

3.2.5 Steel Casing Pipe. The carrier pipe of the material and locations as shown on the drawing crossing the existing main road shall be installed in the completed casing. Steel casing pipe shall be installed using equipment that encases the hole as earth is removed. Boring without concurrent installation of the casing pipe will not be allowed. All joints in casing pipe shall be made with continuous welds. Casing pipe shall extend through the entire width of road and shoulders. After installation of carrier pipe, brick bulkheads shall be installed at the ends of the casing pipe.

3.2.6 Thrust Blocks. Blocking shall be placed between solid ground and the fitting to be anchored. Unless otherwise indicated or directed, the base and thrust bearing sides of thrust blocks shall be placed directly against undisturbed earth. The sides of thrust blocks not subject to thrust may be placed against forms. The area bearing shall be as shown or as directed. Blocking shall be placed so that the fitting joints will be accessible for repair.

3.3 WATER AND SEWER SEPARATIONS. Water and sewer separations shall be as specified in SECTION 02510 - WATER SUPPLY LINES AND SPECIAL EQUIPMENT.

3.4 PLASTIC WARNING TAPE. A continuous warning tape shall be installed 1 foot below finished grade directly above and parallel to the buried sewer pipe.

3.5 FIELD TESTS. Hydrostatic and leakage tests shall be performed as specified in SECTION 02510. Piping requiring embedment or becoming inaccessible after installation shall be tested prior to installation under the above conditions.

3.6 CLEANING AND ADJUSTING. At the completion of the work, all parts of the installation shall be thoroughly cleaned. All equipment, pipe, valves, and fittings shall be cleansed of grease, metal cuttings, and sludge which may have accumulated by operation of the system for testing. Any stoppage, discoloration or other damage to parts of the building, its finish, or furnishings, due to the Contractor's failure to properly clean the piping system, shall be repaired by the Contractor without cost to the Government. Flush valves, automatic control devices, and other parts of the work shall be adjusted for proper operation.

3.7 DEFECTIVE WORK. If inspection or tests show defects, such defective work or material shall be replaced and inspection and tests repeated. Repairs to piping shall be made with new material. No caulking of screwed joints or holes will be acceptable.

3.8 FLUSHING. The new pressure sewer shall be flushed with sufficient water to clean out all debris from the lines. Several outlet valves shall be open simultaneously to provide a satisfactory flow in the main line.

-- END OF SECTION 02530 --

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SECTION 02535
LIFT STATION

PART 1 - GENERAL

1.1 REFERENCES. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto.

1.1.1 American National Standards Institute (ANSI).

B 16.1-89	Cast Iron Pipe Flanges and Flanged Fittings

1.1.2 American Society for Testing and Materials (ASTM).

A 48-94	Gray Iron Castings
A 53-96	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
A 159-83 (R 1993)	Automotive Gray Iron Castings
A 325-96	Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
A 536-84 (R 1993)	Ductile Iron Castings
A 563-96	Carbon and Alloy Steel Nuts
C 443-94	Joints for Circular Concrete Sewer and CulvertPipe, Using Rubber Gaskets
C 478-96	Precast Reinforced Concrete Manhole Sections

1.1.3 American Water Works Association (AWWA).

C 104-95	Cement-Mortar Lining for Ductile Iron Pipe and Fittings for Water
C 110-93	Ductile-Iron and Gray-Iron Fittings, 3 in. Through 48 in., for Water and Other Liquids
C 111-95	Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings
C 150-91	Thickness Design of Ductile-Iron Pipe
C 151-91	Ductile-Iron Pipe Centrifugally Cast for Water or Other Liquids

C-509-94 Resilient-seated Gate Valves for Water Supply Service

1.1.4 National Electrical Manufacturers Association (NEMA).

ICS 2-93 Industrial Control and System Controllers, Contactors, and Overload Relays Rated Not More Than 2000 Volts AC or 750 Volts DC

1.1.5 Underwriters Laboratories, Inc. (UL).

UL 508-93 (16th Ed. 9/94 Bul thru 5/12/95) Industrial Control Equipment

1.2 GENERAL REQUIREMENTS. The wastewater lift stations located in Loop 3 and Loop 4 shall consist of submersible pumps, hoisting guides, access cover, automatic control equipment, valve chamber, and all other necessary piping, valves, and accessories indicated on the drawings and specified herein. The Contractor shall furnish the pumps, motors, hoisting guides, guide rails and supports, control panel, and any other equipment unique to the pumping system, from the same manufacturer. Fabricated parts used to adapt one pump manufacturers parts to another will not be acceptable.

1.3 SUBMITTALS. Government approval is required for submittals with a "GA" designation; submittals having and "FIO" designation are for information only. The following shall be submitted to the Contracting Officer in accordance with SECTION 01300 - SUBMITTAL PROCEDURES.

1.3.1 Data. Materials and Equipment; GA. Submit manufacturer’s descriptive data for all materials and equipment specified herein. All components which must be integrated such as the pump, hoisting guides, guide rails and supports, and access cover shall be submitted as one complete package to ensure compatibility. Submit instructions and parts list for all specified equipment. Submit manufacturer’s operation, maintenance, servicing, and dismantling data for all specified equipment.

1.3.2 Drawings. Materials and Equipment; GA. Submit shop drawings for all materials and equipment specified herein. All components which must be integrated, such as the pump, hoisting guides, guide rails and supports, and access cover shall be submitted as one complete package to ensure compatibility.

1.4 WARRANTY. The Contractor shall furnish the manufacturer's standard warranty for all equipment provided under this section in accordance with Special Clause 00800-22. All work performed under this section shall conform to the requirements of Contract Clause entitled "Warranty of Construction".

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS. The following materials shall conform to the respective specifications and other requirements specified below.

2.2 PIPE.

2.2.1 Galvanized Pipe. ASTM A 53.

2.2.2 Ductile Iron Pipe. Ductile iron pipe shall conform to the requirements of AWWA C 150 and C 151, Class 51. The pipe shall be mechanical joint or flange end depending on type of installation. Ductile iron fittings shall conform to the requirements of AWWA C 110.

2.3 CONCRETE.

2.3.1 Precast Concrete Manholes. Precast concrete manholes shall conform to ASTM C 478.

2.3.2 Cast-In-Place Concrete. Cast-in-place concrete shall conform to the requirements of SECTION 03300.

2.4 JOINT SEALER. Joint sealer for the particular type of pipe shall be an approved mastic, rubber gasket, or a combination of these types.

2.4.1 Mastic Joints. Mastic joints between precast rings shall be full-bedded in jointing compound and shall be smoothed to a uniform surface on both the interior and exterior of the manhole. The mastic shall be non-hardening butyl rubber sealant.

2.4.2 Rubber Joints. Installation of rubber gasket joints between precast rings shall be in accordance with the manufacturer's recommendations. Rubber gasket joints shall conform to ASTM C 443.

2.5 IRON CASTINGS. ASTM A 48.

2.6 VALVES. Valves shall be the type indicated conforming to the following:

2.6.1 Gate Valves. The gate valves shall conform to the requirements of AWWA C 509. The valve shall have a non-rising stem and have an operating nut which opens by turning counterclockwise. The valve shall be Class 125 with a minimum working pressure of 150 psi, suitable for wastewater. The valves shall be furnished with handwheels.

2.6.2 Ball Check Valves. Ball check valves shall have ASTM A 159, Class 35 cast iron body, with ANSI B 16.1, Class 125 flanged ends and shall be of the sinking type with vulcanized nitrile rubber covered hollow steel balls. The valves shall be designed for a working pressure of 150 psi and a temperature of 185 degrees F. In operation, the ball shall be guided to and from its seat by smooth ribs integrally cast into the housing wall.

2.7 RESERVED.

2.8 STRUCTURAL ACCESSORIES.

2.8.1 General. The access hatch, guide brackets, guide rails and supports, cable holder, anchor bolts, chains and appurtenances are considered integral parts of the pumping units and shall be furnished by the pump

manufacturer. The rails shall guide the pump from the discharge to a point just below the access door.

2.8.2 Access Hatch and Frame. The access hatch and frame shall be furnished as an integral unit. The frame shall be constructed of aluminum and cast into the top structure. The access door shall be complete with hinges, flush handle, 90 degrees safety position lock, hasp and staple. The hatch shall be capable of supporting uniform loads of 150 pounds/square foot. All aluminum in direct contact with concrete shall be protected with a coat of tar or other approved material.

2.8.3 Guide Brackets. Upper guide brackets may be cast or fabricated of steel plates and installed as recommended by the pump manufacturer. The upper guide bracket shall be galvanized. The lower guide bracket shall be integral with the discharge connection and painted with the pump manufacturer's standard coatings or coal tar epoxy. The guide bars shall be constructed of standard galvanized pipe, the size as recommended by the pump manufacturer, cut to length and installed plumb. The pump shall incorporate guide brackets which guide and induce seat forces on the discharge connection equal to at least twice the pump weight. The Contractor shall provide a concrete base incorporating the anchorage bolts for the pump base and installed at a height recommended by the pump manufacturer.

2.8.4 Cable Holder. A steel cable holder shall be attached to or near the door frame to support the liquid level sensors and to provide strain relief for the power cables to the submersible motors.

2.8.5 Anchor Bolts. All anchor bolts in the pump well shall be stainless steel with bronze companion nuts and stainless steel washers.

2.8.6 Chains. Stainless steel chains shall be provided for removing the submersible grinder pumping units. The chains shall be rated for a working load of twice the dry weight of the pumping units. Stainless steel shackles and eyebolts shall be used to connect the chain and pumping units. At least 2 intermediate lifting eyes shall be provided. Hooks shall be provided on the access hatch to support the chains.

2.8.7 Hasps, Staples and Hardware. The Contractor shall provide corrosion resistant hasps, staples, and bolts, nuts and washers for the access door on the pump station and for the gate. The hasps and staples shall be suitable for 1-1/2 inch locks with 1/4 inch shackle.

2.9 LIFT STATION VALVE CHAMBER. The valve chambers shall be located and constructed as shown on the drawings. The proposed piping, valves, and frame cover shall be submitted to the Contracting Officer for approval prior to installation.

2.10 LIFT STATION WET WELL.

2.10.1 Wet Well. The pump wet well shall be precast sections conforming to ASTM C 478 and shall have the inside diameters as shown on the contract drawings. A concrete filler with a 1:1 slope shall be formed at the bottom of the wet well to funnel sewage to the pump locations. All electrical systems and components in the wet well, including pump motors, cables,

conduits, and switchboxes, shall comply with the National Electric Code requirements for Class 1 Group D, Division 1 locations.

2.10.2 Top Structure. A concrete flat slab top shall be furnished for the pump wet well, and shall be Contractor designed as shown on the drawings. The pump access door frame shall be cast into the top structure. The layout of the access door shall be arranged as recommended by the pump manufacturer and such that there shall be no interference with removal of the pump units. The Contractor shall submit shop drawings of the top slab to the Contracting Officer for approval. The reinforcing steel and the access door shall be completely detailed. The slab shall be designed for a uniform load of 150 pounds/square foot. The diameter of the top structure shall match the diameter of the wet well structure.

2.10.3 Openings. All openings and pipe sleeves installed in the wet wells shall be sealed with nonshrink grout or other methods approved by the Contracting Officer, after installation of cables or pipes.

2.11 SUBMERSIBLE GRINDER PUMP.

2.11.1 Description. The Contractor shall furnish a duplex grinder pump unit and one spare pump with all necessary parts and equipment, and install the pump unit in the wet well. The pump unit shall be capable of grinding all sewage, including rags, wood, plastic, paper and rubber, into particles small enough to be pumped under pressure into the proposed sewer as shown on the drawings.

2.11.2 Pump Capacities. The pumps furnished shall be explosion proof to meet the requirements of National Electric Code requirements for Class 1, Group D, Division 1 locations. The pumps furnished shall be capable of operating without instability at the design point of 70 gpm at 34 feet TDH in Loop 3 lift station. The pumps for Loop 3 shall be a F.E. Meyers Co. WGX30, 3 Hp, 3 3/4" diameter impeller. The pumps furnished shall be capable of operating without instability at the design point of 65 gpm at 68 feet TDH in Loop 4 lift station. The pumps for Loop 4 shall be a F.E. Meyers Co. WGX50, 5 Hp, 4 3/4" diameter impeller. The design operating point of the pumps furnished shall not be within 20 percent of the pump maximum rated capacity and/or pump shut off points. The grinder pumps operating curve shall be furnished to the Contracting Officer for approval.

2.11.3 Pump. The pumps shall be centrifugal type with volute case and semi-open impeller with pump-out vanes on the back shroud. Grinder impeller shall discharge directly into inlet of centrifugal impeller leaving no exposed shaft to cause packing of ground solids.

2.11.4 Material. The pump and motor housings shall be cast iron and painted with the manufacturer's standard coating. Pump impeller shall be bronze and shall thread onto a stainless steel shaft.

2.11.5 Grinder Unit. The grinder unit shall consist of a primary grinder and a secondary cutter impeller. The parts of the grinder unit shall be stainless steel turning on hardened stainless steel. The complete grinder assembly shall be removable from the pump without disturbing the pump

impeller, seals or motor. An extra set of cutters and comb assembly (grinder elements) shall be furnished for each pump station.

2.11.6 Check and Gate Valve and Piping. The discharge piping in the valve chambers shall include a ball check valve and gate valve for each pump. The discharge from the station shall be fitted with two ductile iron couplings conforming to ASTM A 536. All pipe joints and exposed threads shall be coated with a cold galvanizing compound conforming to ASTM A 780. Gaskets shall be Grade 30 - standard - specially compounded rubber of all new materials conforming to AWWA C111. Bolts shall be high strength low alloy steel conforming to ASTM A 325, with heavy semi-finished hex nuts conforming to ASTM A 563.

2.11.7 The Contractor shall supply with the pumping units, 3 complete operation and maintenance manuals.

2.12 PUMP MOTORS. Pump motors shall be housed in an oil filled watertight casing and shall be NEMA Design B, with Class B insulated stator windings which shall be moisture resistant. The motors shall be rated for 230 volts, single phase, 60 hertz. The pump motors shall have cooling characteristics suitable to permit continuous operation in submerged or non-submerged conditions. The cable junction box within the motor shall be separated from the motor proper by a stator-lead sealing gland to protect the motor should water leak into the junction box. The pump motor cables shall be connected to the motor through a rubber grommet compression seal. The electrical cables shall be suitable for submersible service, and shall be of water-blocking construction; the cable shall have permanent marking showing its water-blocking construction. The cable shall be continuous, without splices or taps, from motor to control panel, and shall include a motor ground conductor for connection in the motor junction box. The motor shall be equipped with seal leak probes and on-winding heat sensors to detect seal leaks and to stop the motor if the motor overheats. Waterproof control cables shall be provided for data signals from the thermal sensors wound into the phase belts of the motor winding, and for the water-in-oil sensor. Motors requiring external heat exchangers or piping which could fracture during normal maintenance procedures will not be acceptable. Acceptance of higher installed running current by utilizing the service factor, if greater than unity, is prohibited. The motor rated horsepower, full load amp rating, operating voltage, phase, service factor, full load speed, and motor manufacturer's name, shall be shown on an externally mounted name plate. The nameplate shall be provided by the manufacturer of the motor. Field installation or changing of motor nameplates will not be allowed. Any changing of motor nameplates required by the Contractor shall be accomplished by the motor manufacturer at the factory, after factory tests on the motor in question have been completed. Results of this factory test shall be submitted to the Contracting Officer.

2.13 MOTOR CONTROLS. Motor controls shall conform to the requirements of NEMA ICS 2 and UL 508.

2.13.1 NEMA 4X Pump Motor Control Panel. Service to the panel shall be 240 volts, single phase, 60 Hertz, 3-wire. All items shall be installed inside the control panel enclosure, except for the red polycarbonate High Wet Well Level Alarm Strobe Light with cast protective guard, which shall be hub

connected to the top outside of the control enclosure. Capacitors and controls required with the three phase motors shall be mounted in the lowest section of the control panel.

2.13.1.1 A main two-pole circuit breaker shall be furnished. For each pump motor there shall be furnished an individual combination type two-pole motor starter with circuit breaker, 120 vac operating coil, 2 manual-reset ambient-compensated thermal overloads sized to the full-load amperes of the motor actually installed, a "Hand" - "Off" - "Automatic" selector switch, "Stop", "Start" push buttons, a red "Run" pilot light, and an elapsed time meter. Circuit breakers and combination circuit breaker motor starters shall be sized according to pump manufacturer's recommendation. Control voltage shall be 120v from the 120/240 vac service and shall be protected by fuses, as shown on the drawings. Each motor shall have over-temperature sensing thermostats wound into the windings of the pump motor, which shall automatically reset to the closed circuit condition when cool. A seal leak detector shall open its circuit when sensing the presence of water-in-oil in the submerged motor. The detector shall be connected in series with the over-temperature sensors to disconnect the machine from the line in the event of either over-temperature or water-in-oil. In the circuit diagram, a neon indicator lamp shall be connected across the series combination of these device, to glow when either of the sensors have opened and halted the motor. An override circuit shall be included which will automatically start the second pump if the first pump fails to give adequate delivery, allowing the water level to rise to the level where the second pump needs to be started. An interlock circuit shall be included to prevent simultaneous manual operation of both pumps. An alternator shall be provided to equalize the running time for each motor. The panel shall be equipped with a bonded silicone rubber embedded electrical heater of 150 watts capacity, bonded to its backplane, and an adjustable thermostat, single-pole single-throw, line-voltage type and adjustable from 40 to 90 degrees F, to prevent condensation. Control wiring shall be No. 14 stranded copper and shall be tested for one minute at twice line voltage plus 1000 vac. A neutral bus shall receive the neutrals of the control circuit, which shall be connected to ground. Wiring duct, with covers, shall be used to route wiring inside the control panel. Details shall be as shown on the contract drawings.

2.13.1.2 The enclosure shall be mounted on the shower building as shown on the drawings.

2.13.1.3 Conduit entries shall be made in RGS conduit into the enclosure using sealing type threaded conduit. Each conduit from the lift station to the control panel enclosure shall be equipped with a sealing fitting suitable for Class I, Division 1 Hazardous locations. Each fitting shall be installed with sealing compound, no more than 18 inches from the enclosure. The sealing fittings shall have minimum turning radius, large openings, threaded closures, and taper-tapped hubs.

2.13.2 Pump Motor Control Panel Enclosure. The pump motor control panel enclosure shall be NEMA 4X. The Contractor shall furnish a padlock with 6 keys.

2.13.3 Alarm Secondary Power. The Contractor shall install at the lift station a high level alarm system as shown on the contract drawings. The

system shall have a self-contained rechargeable power supply. The power supply shall be protected against shorts and have lightning and brownout protection. The transformer shall be current limiting and of rugged design. The transformer shall have an input voltage of 120 volts 60 Hz, and an output of 16 volts dc. The red strobe light and horn shall be rated for 12 volts dc, and a silence switch shall be provided for the horn.

2.13.4 Pump Motor Level Sensors. Four level sensors shall be furnished to control the operation of the pumps. Each level sensor shall consist of a glass-vial mercury switch housed within waterproof electrical control wiring from a support bracket on the lift station cover. The support bracket permits easy adjustment of the elevations of the float level sensors. Each control wire attached to a float level sensor shall have sufficient length to reach from the bottom of the wet well sensor to the control panel without splices or junction boxes. When setting the level sensors at the specified elevations the excess float switch lead wire shall be coiled inside the lift station. The mercury float switches in the lift station level control circuits shall operate in a 120 vac control circuit.

2.14 AIR BLOWER AND MOTOR.

2.14.1 Blower Motor. The air blower motor shall be rated at 1.5 HP, 230V, single phase, 1700 RPM and shall be equipped with V-belt drive. The motor shall be of the open drip-proof type and shall be capable of delivering 30 CFM when operating at 6 psi.

2.14.2 Air Blower. The blower shall be enclosed with a molded fiberglass weatherproof enclosure. The enclosure shall be furnished with lifting handles, and hasp and staple for locking. The blower unit shall be furnished with spare air cleaner, set of belts, and sheaves for blower. The blower unit shall be installed on a concrete slab, 6 inches thick and set with the top slab elevation 3 inches above final grade. The concrete slab shall be level and shall provide 3 inches clearance on each side of the fiberglass enclosure; concrete shall conform to the requirements of SECTION 03300. The concrete slab shall be reinforced with 6x6 - W2.9 x W2.9 welded wire fabric.

2.14.3 Control Panel for Air-Blower. A NEMA 4X control enclosure with rainlip, shall be provided as shown on the contract drawings. The control enclosure shall have installed under locked cover, a combination circuit breaker type motor starter for the blower of the correct NEMA size to start and operate the motor provided for the blower. The combination starter shall be operated with 120 vac coil, shall have 2 manual-reset ambient-compensated thermal overloads sized to the FLA of the motor actually installed, and have a "Manual" - "Off" - "Auto" selector switch inside the control enclosure. The 120 vac coil supply voltage shall be from the pump power supply. A 50 watt silicone-rubber embedded heating element shall be bonded to the backplane of the enclosure, and shall be controlled by an adjustable thermostat. A 24 hour programmable timer with minimum 1/4 hour operating intervals, operating from the 120 vac control supply, is required to provide the timed control for the "Automatic" operation of the blower motor; it shall be provided with a "days skipper" and manual override. An elapsed time meter shall be provided. The conduit to the motor shall leave the enclosure to go underground to the FRP enclosure of the positive displacement blower. The air pipe shall run underground into the wetwell to connect to the descending pipe delivering air

to the sparger located under the water level. Piping and conduits run underground shall be coated with bituminous coating.

2.14.4 Time Switch. Time switch shall have 15 minute multiple internal time control with 24 hour dial and 96 self-contained trippers. The switch shall have Single Pole, Single Throw (SPST) isolated contacts rated 15 amps at 120 volts.

2.14.5 Aeration Piping. A 1-inch diameter galvanized steel riser pipe shall extend from the top of pump well to within 1.5 feet of the bottom of pump well. At that point the riser pipe shall branch out into 3 equally spaced outlets with 1/2-inch schedule 40 PVC pipe across the diameter of the pump well. These outlets shall have a 2 feet to 3 feet section of 1/2-inch schedule 40 PVC pipe attached to introduce an air supply near the bottom of the pump well. The outlets and pipe shall not interfere with the location or operation of the pumps. The riser pipe shall be secured to the wet well with galvanized riser clamps. The 1-inch riser pipe shall pass through the wet well as shown on the drawings.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS. Grinder pump, lift station and accessories shall be installed at the locations shown on the drawings, as specified and in accordance with the manufacturer's recommendation.

3.2 EXCAVATION AND BACKFILL. Excavation for and backfill around structures shall be as specified in SECTION 02315.

3.3 TESTS. Tests shall be performed as specified herein and to the satisfaction of the Government.

3.3.1. Field Test. The pumps shall be field tested in the presence of the manufacturer's representative and the Contracting Officer. The Contractor shall furnish the field test results to the Contracting Officer. The manufacturer's representative shall inspect the installation prior to the field test, and any defects shall be corrected by the Contractor. The capacity, head, and amperage shall be verified. Water for the pump station operating tests will be made available by the Government up to 10,000 gallons, with the existing water service line in the access area. If water usage exceeds 10,000 gallons, the Contractor shall furnish the additional water. Sufficient water shall be provided for operation in the full pumping range including alarm function and with each pump individually. Water may be non-potable, but shall be non-sewage in nature.

3.3.2 Factory Test. Before shipment, the equipment shall be tested for compliance with specification requirements and applicable safety standards.

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DIVISION 2 – SITE WORK

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SECTION 02540
SANITARY SEWERS

PART 1 - GENERAL

1.1 REFERENCES. The following publications of issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

1.1.1 American Society for Testing and Materials (ASTM).

A 53	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
C 443-94	Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
C 478-96	Pre-Cast Reinforced Concrete Manhole Sections
D 3034-93	Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings

1.1.2 American Water Works Association, Inc. (AWWA):

C 200	Steel Water Pipe - 6 in. (150 mm) and Larger

1.2 GENERAL. The gravity sewer system specified herein and shown on the drawings consists primarily of installing eight-inch main sewer lines and manholes, and four-inch service connections. Four inch PVC sewer line shall be used to reconnect the sewer services from the existing buildings to the new manholes on Lines A and B.

1.2.1 Work covered by this section will not be accepted until backfilling connected with the work has been completed satisfactorily. Any section of sewer pipe that is found defective in material, alignment, grade, or joints before acceptance shall be satisfactorily corrected by the Contractor at the Contractor's expense.

1.3 SUBMITTALS. Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted to the Contracting Officer in accordance with SECTION 01300 - SUBMITTAL PROCEDURES.

1.3.1 Drawings. Materials and Equipment; GA. Submit shop drawings of all work covered by this section of the specifications which requires fabrication. Where materials or equipment are standard stock products of manufacturers, full descriptive data shall be submitted, including catalog

cuts and specifications. These shop drawings shall include as a minimum, drawings and catalog cuts for all piping and fittings.

PART 2 - PRODUCTS

2.1 MATERIALS. The following materials shall conform to the respective specifications and other requirements specified below.

2.1.1 Polyvinyl Chloride (PVC) Sewer Pipe. Sewer pipe shall conform to ASTM D 3034, Type PSM SDR 35, bear the seal of the National Sanitation Foundation Testing Laboratories, and shall be furnished in minimum lengths of 20 feet for gravity sewers. The PVC pipe shall be manufactured of materials conforming to ASTM D 1784, Grade 12454-B.

2.1.2 Rubber Rings. Rubber rings shall be for bell-and-spigot as recommended by the manufacturer of the pipe.

2.1.3 Precast Concrete Manholes. Precast manholes shall conform to ASTM C 478. Rubber gaskets shall conform to ASTM C 443.

2.1.4 Plastic Warning Tape. Plastic warning tape for the water line shall be as specified in Section 02315 - EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES.

2.1.5 Steel Casing Pipe. Casing Pipe shall be welded steel pipe, new material, conforming to **AWWA C 200** for water pipe, and steel conforming to **ASTM A 53**, Grade B, with a minimum yield strength of 35,000 psi. The wall thickness shall not be less than 0.1875 inches for 6 inch diameter and .203 inches for 12 inch diameter casing pipe.

PART 3 - EXECUTION

3.1. INSTALLATION. Installation of the gravity sewer system shall be in accordance with all applicable Federal, State and local regulations.

3.1.1 General. Excavation and backfilling of trenches shall conform to the applicable provisions of SECTION 02315. All gravity sewer pipes shall be laid to the depth and slopes as shown on the drawings. All gravity sewer lines shall be laid out well in advance of the time excavation is expected to begin and shall be checked by the Contracting Officer. PVC pipe shall be protected during storage and installation from direct sunlight and excess heat. Any deformed or defective pipe shall be replaced by the Contractor at no additional cost to the Government. All pipe shall be assembled by a method approved by the Contracting Officer. Immediately after laying, plastic pipe shall be covered leaving the joints exposed until after completion of the necessary tests.

3.1.2 Cutting of Pipe. Cutting of pipe shall be accomplished in a neat and workmanlike manner without damage to the pipe. Unless otherwise recommended by the manufacturer or authorized by the Contracting Officer, cutting shall be performed with an approved type mechanical cutter.

3.1.3 Jointing of PVC Pipe. Jointing PVC pipe shall be accomplished as specified by the manufacturer and/or as follows:

(1) Clean spigot ends, grooves, and gaskets of all dirt and foreign materials, paying particular attention to the gasket groove.

(2) Set the gasket in the groove making sure the gasket is not twisted or turned to prevent proper seating.

(3) Lubricate the plain end of the pipe and gasket with lubricant as recommended by the manufacturer of the pipe.

(4) Push the plain end into the bell or coupling so that the mark on the plain end is in line with the end of the bell or coupling.

3.1.4 Cross Connections and Interconnections. No piping shall be installed that will provide a cross connection or interconnection between a distribution supply for drinking or domestic purposes and a polluted supply such as a waste pipe.

3.1.5 Separation and Crossings of Water Lines and Sewer Lines. Requirements for horizontal and vertical separations shall be as specified in Section 02510.

3.1.6 Plastic Warning Tape. A continuous warning tape shall be installed approximately 12 inches below finished grade, directly above, and parallel to the buried sewer line.

3.1.7 Connection to Existing Structures. The Contractor shall connect the new 8-inch gravity sewer discharge lines to the existing manholes as shown on the drawings. Care shall be taken to prevent damage to the existing structures. Interior grouting and patching shall be accomplished as soon as possible after the new pipe has been inserted into structure and has been adequately supported to prevent movement. Any damage to the structures shall be repaired by the Contractor at no additional expense to the Government.

3.1.8 Precast Concrete Manholes. The Contractor shall install the precast concrete manholes as shown on the drawings.

3.1.9 Steel Casing Pipe. The carrier pipe of the material and locations as shown on the drawing crossing the existing main road shall be installed in the completed casing. Steel casing pipe shall be installed using equipment that encases the hole as earth is removed. Boring without concurrent installation of the casing pipe will not be allowed. All joints in casing pipe shall be made with continuous welds. Casing pipe shall extend through the entire width of road and shoulders. After installation of carrier pipe, brick bulkheads shall be installed at the ends of the casing pipe.

3.2 TESTS. The Contractor shall perform leakage tests on all completed sewer and drain lines. Tests shall be either by hydrostatic or air testing means as described herein and shall be performed in the presence of the Contracting Officer.

3.2.1 Hydrostatic Test. Gravity sewer lines shall be tested for leakage by either infiltration or exfiltration tests, as appropriate. Prior to testing for leakage the trench shall be backfilled up to at least the lower half of the pipe. If required, sufficient additional backfill shall be placed to prevent pipe movement during testing, leaving the joints uncovered to permit inspection. The requirement for the joints to remain exposed for the leakage tests may be waived by the Contracting Officer when one or more of the following conditions is encountered:

(1) Wet or unstable soil conditions in the trench.

(2) Compliance would require maintaining barricades and walkways around and across an open trench in a heavily used area that would require continuous surveillance to assure safe conditions.

(3) Maintaining the trench in an open condition would delay completion of the contract.

(4) An unforeseeable cause which could result in excess cost.

The Contractor may request the waiver, setting forth in writing the reasons for the request and stating the alternative procedure proposed to comply with the required leakage test. Visible leaks encountered shall be corrected regardless of leakage test results. When the water table is two feet or more above the top of the pipe at the upper end of the pipe line section to be tested, infiltration shall be measured using a suitable weir or other device acceptable to the Contracting Officer. When the Contracting Officer determines that infiltration cannot be properly tested, an exfiltration test shall be made by filling the line to be tested with potable water so that a head of at least two feet is provided above both the water table and the top of the pipe at the upper end of the pipe line to be tested. The filled line shall be allowed to stand until the pipe has reached its maximum absorption, but not less than four hours. After absorption, the head shall be re-established. The amount of water required to maintain this water level during a two-hour test period shall be measured. Leakage as measured by either the infiltration tests or exfiltration tests shall not exceed 200 gallons per inch diameter per mile of pipeline per day. When leakage exceeds the maximum amount specified, satisfactory correction shall be made and retesting accomplished. Testing, correction, and retesting shall be made at no additional cost to the Government.

3.2.2 Air Test. If tests are made with air, a pressure of not less than 5 pounds per square inch shall be applied with a force pump and maintained at least 15 minutes without leakage. A mercury column gage shall be used in making the air test.

3.2.3 Deflection Test. The entire pipeline shall be tested for excess deflection by pulling a "go - no go" mandrel through the pipe from manhole to manhole. The mandrel shall have a diameter equal to 95% of the inside or base diameter of the pipe as established by the ASTM standard to which the pipe is manufactured. The test shall be performed without mechanical pulling devices. Wherever possible and practical, the testing shall initiate at the downstream lines and proceed towards the upstream lines. No pipe shall exceed a deflection of 5%. The individual lines to be tested shall be tested for final

acceptance no sooner than 30 days after they have been installed.

3.3 FLUSHING. All sewer lines shall be flushed, either prior to the tests or after, to clean all debris from the lines.

-- END OF SECTION 02540-

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DIVISION 15 - MECHANICAL

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SECTION 15120
VALVES AND GAGES

PART 1 GENERAL

1.1 SCOPE. The work covered by this section of the specifications consists of furnishing all plants, labor, materials, and equipment, and performing all operations necessary for the installation of the air release/ air vacuum valve shown on the drawings and specified herein.

1.2 QUALITY CONTROL.

1.2.1 General. The Contractor shall establish and maintain quality control for all operations to assure compliance with contract requirements and maintain records of its quality control for all construction operations, including but not limited to the following:

(1) Materials.
(2) Installation.
(3) Tests.

1.2.2 Reporting. A copy of these records and tests, as well as the records corrective action taken, shall be furnished to the Government daily.

1.3 APPLICABLE PUBLICATIONS. The following publications of issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the references thereto:

1.3.2 American Society for Testing and Materials (ASTM).

A 47-90	Ferritic Malleable Iron Castings
A 48-94	Gray Iron Castings
A 53-96	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
C 76-90	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
C 443A-85 (R1990)	Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
C 478-93 (Rev B)	Precast Reinforced Concrete Manhole Sections

1.3.3 American National Standards Institute (ANSI).

B-16.3-92	Malleable Iron Threaded Fittings

1.3.4 American Water Works Association (AWWA).

C 509-87 Resilient-Seated Gate Valves for Water and Sewerage Systems

1.4 GENERAL. The valves specified herein and shown on the drawings consists primarily of installation of combination sewage air release/air vacuum valves, and valve chambers along the pressure sewer line. Work covered by this section will not be accepted until backfilling connected with the work has been completed satisfactorily, and all corrections of defective items of work have been completed satisfactorily at no additional cost to the Government.

1.5 SUBMITTALS. Government approval is required for all submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with SECTION 01300 SUBMITTAL PROCEDURES:

1.5.1 Data. Materials and Equipment; GA. Submit manufacturer’s descriptive data for all materials and equipment specified herein.

PART 2 - PRODUCTS

2.1 GALVANIZED PIPE. ASTM A53.

2.2 CONCRETE PIPE. ASTM C 76, Class III, Wall B.

2.3 IRON CASTINGS. ASTM A 48.

2.4 VALVES. Gate valves shall conform to the requirements of AWWA C 509. Valves shall be the product of a manufacturer regularly engaged in their production and shall be suitable for the use intended.

2.5 JOINT SEALER. Joint sealer for the particular type of pipe shall be an approved mastic, rubber gasket, or combination of these types.

2.5.1 Mastic Joints. Mastic joints between precast rings shall be full-bedded in jointing compound and shall be smoothed to a uniform surface on both the interior and exterior of the manhole. The mastic shall be non-hardening butyl rubber sealant.

2.5.2 Rubber Joints. Installation of rubber gasket joints between precast rings shall be in accordance with the manufacturer's recommendations. Rubber gasket joints shall conform to ASTM C 443.

2.6 PRECAST CONCRETE MANHOLE SECTIONS. Precast concrete manhole sections shall conform to ASTM C 478.

2.7 FITTINGS. Malleable iron 150 Lb standard; dimensions ANSI B 16.3, material ASTM A 47.

PART 3 EXECUTION

3.1 COMBINATION AIR RELEASE/AIR VACUUM VALVES AND VALVE CHAMBERS.

3.1.1 General. The combination air release/air vacuum valve shall be installed on the pressure sewerline at the high point in the vicinity shown on the drawings and specified herein. The exact location of the valve shall be determined in the field based on the valve chamber dimensions indicated on the drawings, and shall be approved by the Contracting Officer.

3.1.2 Valve Chamber. Concrete valve chamber for the combination air release/air vacuum valve shall be constructed as shown on the drawings. The lid shall be a vented type. In areas which are mowed on a regular basis, the chamber shall be flush with the ground. In areas which will remain wooded the chamber shall be raised as indicated on the drawings.

3.1.3 Combination Air Release/Air Vacuum Valve. The combination air release/air vacuum valve shall combine the features of both the air vacuum valve and the air release valve. The air release valve shall allow air to exit the line during normal pump operation and the air vacuum valve allows air to enter or exit during filling of the pipe line or during gravity drainage of the descending portion of the pressure sewer line. The air release valve shall have a 1/4-inch orifice which is based on a fill rate of 10 cfm and a working pressure of approximately 150 psi. The air vacuum valve shall have a 1-inch orifice which is based on a gravity drainage rate of 65 cfm and a pressure differential across the valve of 5 psi.

-END OF SECTION 15120-

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